The Economic Efficiency of a Voluntary Assignment System

Paul F. Hogan   Patrick C. Mackin

The Lewin Group SAG Corporation

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Outline

➢ Problem

➢ Theory

➢ Voluntary Assignment System

➢ Potential Benefits

➢ Evaluation of Program Implementation

➢ Summary

Problem

➤ Navy Assignments and Personal Preferences

➤ Current Adjustment Mechanisms

➤ What Makes Some Assignments "Undesirable"?

➤ Consequences of Involuntary Assignment

➤ Costs of Involuntary Assignment

Navy Assignments and Personal Preferences

- Navy and other Services must staff variety of positions all over the world
  - Positions vary in "desirability"
- Navy attempts to accommodate member preferences to limited extent
  - But generally follows assignment policy of *share the gain, share the pain*
  - Assignments at desirable locations followed by assignments at less desirable locations (sea-shore rotation)

Current Adjustment Mechanisms

- Overseas cost of living allowance (OCONUS COLA)
  - Attempts to hold members financially harmless for differences in cost of living between the continental US (CONUS) and overseas location
- CONUS COLA
- Sea Pay
- SDAP
- Hardship Duty Pay

What Makes Some Assignments "Undesirable"?

➢ Cost
  • COLAs and in-kind benefits address this difference
➢ Environment
  • Climate
  • Culture
  • Urban/rural environment
➢ Personal circumstances
  • Spouse employment
  • Children's education status
➢ Differences in taste

Consequences of Involuntary Assignment

➤ Involuntary assignment system that fails to compensate members will result in
- Lower retention
- Greater turbulence
- Higher total cost of maintaining peacetime readiness

➤ It is an all-volunteer force
- Effects of assignment policies reflected in stay/leave decisions

➤ Effects of assignment policy on retention difficult to isolate econometrically
- Effects of sea duty in Navy have been measured

Costs of Involuntary Assignment

- Surveys indicate potential importance.
  - 1999 GAO Report
    - Air Force conducted survey of 633 departing personnel to determine reasons for separating
    - Participants asked if there was one single thing Air Force could do to retain them
    - Most frequently cited change was more choice in assignments
- Effects of "share the gain, share the pain" rotation policies on other costs have never been explicitly analyzed
- Costs of turbulence associated with more frequent moves
  - PCS costs
  - Productivity losses
  - transient account manpower

Theory

- Hypothesis
- A Simple Model
- Illustrative Example

Hypothesis

➢ A voluntary assignment system will naturally allocate assignments to qualified staff for whom the costs are lowest, given tastes and circumstances

A Simple Model

➤Assume
- Two positions to fill – *a* & *b*
- Two qualified service members to fill them – *i* & *j*

➤Define member *i*'s indirect utility function for each assignment as

$$U_{i,a} = U_{i,a}(p_a, E_a, I_N, \gamma_{i,a}) \ \& \ U_{i,b} = U_{i,b}(p_b, E_b, I_N, \gamma_{i,b}).$$

➤Member *j*'s utility functions are analogous

A Simple Model (contd.)

➤ If member is risk-neutral and assignments are random, utility from staying in the Navy is

$$E(U_{i,N}) = U_{i,a} \cdot P_a + U_{i,b} \cdot P_b$$

➤ Each member's expected welfare from leaving Navy and avoiding either assignment denoted by

$$U_{i,c} = U_{i,c}(F_c, I_c) \quad \& \quad U_{j,c} = U_{j,c}(F_c, I_c)$$

$$E(U_{i,N}) > U_{i,c}. \quad \& \quad E(U_{j,N}) > U_{j,c}.$$

➤ Members will stay in Navy only if

A Simple Model (contd.)

➢ If I_N not enough to keep both sailors

$$SRB = \max\left[U_{i,c} - E(U_{i,N}), U_{j,c} - E(U_{j,N})\right]$$

- This will be most efficient outcome if i & j have identical tastes for each location

$$\forall \gamma_{i,a} = \gamma_{j,a} \,\&\, \gamma_{i,b} = \gamma_{j,b}; \frac{\gamma_{i,a}}{\gamma_{i,b}} < \frac{\gamma_{j,a}}{\gamma_{j,b}}$$

$$\overline{\gamma}_{i,a} > \gamma_{j,a}; \gamma_{i,b} > \gamma_{j,b};$$

➢ Assume that

A Simple Model (contd.)

➢ Either sailor would accept assignment *a* with SRB = 0, but require a positive SRB for assignment *b*

- $SRB_{i,b} < SRB_{j,b}$

- Both sailors retained only if $SRB = SRB_{j,b} \cdot P_b$

- $SRB_{j,b} \cdot P_b = 0.5 \; SRB_{j,b}$ in random assignment system

➢ Total cost to Navy is $SRB_{j,b}$

- Member assigned to location *a* receives economic rent

- Member assigned to location b may suffer welfare loss

$$U_{j,b} + SRB_{j,b} \cdot P_b < U_{j,c} \qquad U_{j,a} + SRB_{j,a} \cdot P_a < U_{j,a}$$

A Simple Model (contd.)

➢ Total cost of outcome is Navy cost plus cost to sailors

- If outcome is *i* assigned to *a* and *j* assigned to *b*

$$TC = SRB_i + SRB_j + (Welfare\ Loss)_j$$

$$TC = 0.5(SRB_{j,b}) + 0.5(SRB_{j,b}) + \lfloor SRB_{j,b}(1 - P_b) \rfloor = 1.5(SRB_{j,b})$$

- If outcome is *i* assigned to *b* and *j* assigned to *a*

$$TC = SRB_{i,b} + SRB_{j,b} - 0.5(SRB_{j,b}) = 0.5(SRB_{j,b}) + SRB_{i,b}$$

A Simple Model (contd.)

➢ Voluntary assignment lowers total cost

- Minimize costs by assigning sailor *i* to location *b* and paying AIP equivalent to $SRB_{i,b}$

➢ Solution cheaper than first random outcome

➢ Cheaper than second random outcome as long as $SRB_{i,b} > SRB_{j,b}P_b$

- Otherwise, second random outcome and voluntary solution have equal cost

Illustrative Example

Sailor	Assignments				
	One	**Two**	**Three**	**Four**	**E(A)**
Abel	$0	$150	$500	$1,000	$413
Baker	$100	$200	$300	$500	$275
Charles	$400	$100	$400	$550	$363
Dilbert	$250	$350	$350	$600	$388
Edwards	$50	$500	$1,000	$550	$525
Fox	$1,000	$1,200	$1,700	$2,000	$1,475

A Voluntary Assignment System

➢ Limitations

➢ Five Principles

➢ Tools to Make It Work

Limitations

➢ Would not apply to deployments within an assignment
- Not a voluntary deployment system

➢ Not a wartime system
- System would be suspended in a war or national emergency, similar to "stop loss" and other measures applied in war or emergencies

➢ Need not apply to first duty assignment
- Simplifies system
- Should be disclosed to applicants

Five Principles

➢ Services make commitment to staff as many assignments as possible with volunteers

➢ Volunteers must be qualified for positions

➢ Members provided with full information on living and working conditions associated with assignments, as far as reasonably possible

➢ Monetary incentives used to encourage qualified volunteers to staff hard-to-fill assignments within reasonable budget limitations

➢ Traditional (non-voluntary) assignment practices used to preserve readiness only as a last resort
  - After good faith efforts to staff voluntarily

Tools to Make It Work – Pay

➢ Solid OCONUS COLA

➢ Sea pay in the Navy

➢ Army's location-specific SRB

➢ Navy's initiative for Assignment Incentive Pay

➢ Proposed Hardship Duty pay

Tools to Make It Work – An Auction System

➢ Web-based electronic marketplace

➢ Navy posts positions, vacancies, expected dates of vacancies, qualifications, and current compensating differentials

➢ Qualified members bid on available jobs

➢ Navy evaluates bids to achieve low-cost solution within readiness/quality parameters

Potential Benefits

- Better match member preferences with Navy requirements
  - Minimize total cost of meeting requirements
  - Increase retention
- Reduce PCS costs, transient account costs through less frequent moves
  - no longer required to *share gain, share pain*
- Improve productivity and readiness by reducing turbulence
- Highlight costs of difficult-to-fill positions
  - Perhaps substitute other, less costly, ways to meet mission requirements

Evaluation of Program Implementation

➢ Initial application not purely voluntary

- But evaluation critical to demonstrate benefits for wider application

➢ Compare actual auction outcomes with "least-cost" solution

- Recognize that other factors still important in assignment decision

➢ Cost-benefit analysis

Summary

➢A voluntary assignment system is a natural extension of an all volunteer force

- Can improve both retention and recruiting
- Mitigate intractable problems such as spouse employment
- Improve productivity

Summary – Keys to Success

- Provide members with good information on assignment locations

- Guarantee solid overseas COLA program

- Allocate sufficient budget to incentives

- Provide commands with good information on qualified candidates

- Develop a reliable system for matching members with assignments (an assignment "marketplace")

- Establish a long-term commitment to maximizing voluntary assignments